

HONEYWELL UOP APPLIED PROCESS EXCELLENCE CENTER



Honeywell UOP is the leading developer of process technology, while Honeywell Process Solutions is the leading developer of process automation and controls.



Introducing the Applied Process Excellence Center

The Honeywell Applied Process Excellence (APEX) Center has been created to facilitate joint innovations for the oil and gas industry between Honeywell UOP (UOP) and Honeywell Process Solutions (HPS).

The center develops new innovative solutions for the optimal operations of refineries, petrochemical, and gas processing plants.

This enables Honeywell to streamline the design, development, fabrication, commissioning, and

startup of new plants, allowing them to be built and enter production sooner, reach target production faster, and operate at peak performance.



Honeywell is Uniquely Positioned to Develop Innovative Solutions for the Hydrocarbon Processing Industry

We are the leading companies for both process licensing and automation. Instead of starting every project from scratch, we have embedded Honeywell UOP process know-how into Honeywell's automation platforms to deliver a superior solution that significantly improves the customer's bottom-line by enabling the plant to start-up sooner, get to full capacity faster and run optimally over its lifecycle.

The Orion Console in the APEX Center



Our Innovations Include:

- Smarter, pre-engineered Human Machine Interface (HMI) which enables greater situational awareness for the plant operator, complex control narratives, safety logic, procedures, advanced alarms and additional instrumentation to enable earlier and better implementation of advanced solutions such as advanced process control.
- Better integration with the UOP critical process control applications (PIC applications).
- New sensors and associated automation to detect and avoid abnormal situations.

- Remote data collection and advanced analytics to help the operators and engineers to avoid abnormal situations and run the plant optimally.

These solutions accelerate the project schedule, enhance the safety and reliability of the plant, and enable the plant to perform optimally over its lifecycle.

In addition to these initiatives, we have set up a state-of-the-art Honeywell User Experience collaboration center in Des Plaines, USA to meet with customers, discuss their specific pain points and to brainstorm and develop unique cross-disciplinary solutions for them.

Improving Project Delivery

For UOP licensed units, if HPS is pre-selected as the Main Automation Contractor (MAC), automation planning can get started as soon as the basic engineering design (Schedule A) has been completed. We fully leverage the lean project execution methodology LEAP™ to:

- Deliver state-of-the-art Distributed Control System (DCS), Safety, Fire & Gas (F&G) systems and Critical Control Applications with embedded UOP design and operations know-how
 - Provide high fidelity operator training simulators (OTS) for the key process units with embedded UOP reactor models, scenarios and exercises and Abnormal Situation Management Consortium (ASM) compliant graphics that match the DCS graphics for the key process units to train the operators well before plant start-up
 - Ensure that all the instrumentation is in place to allow the implementation of advanced process control (APC) as soon as the units are running stably
- These integrated solutions will remove automation from the critical path for plant start-up. *Figure 2* shows how we work together to deliver these results.

This is How We Deliver the Value

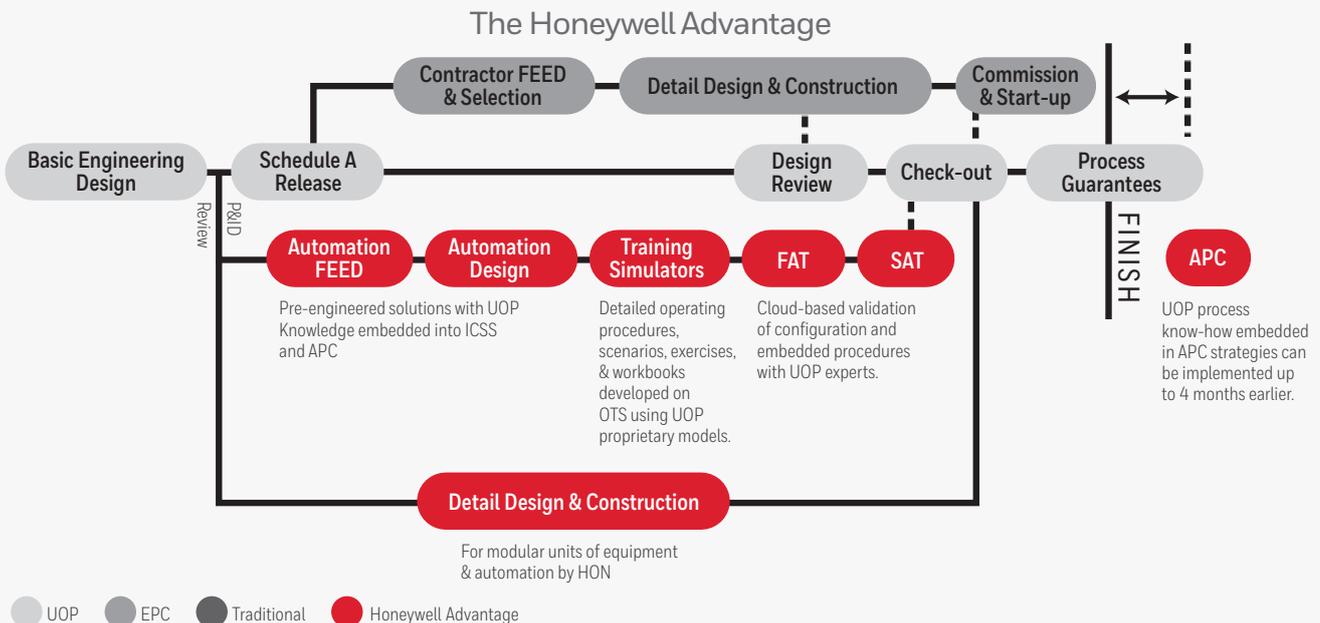
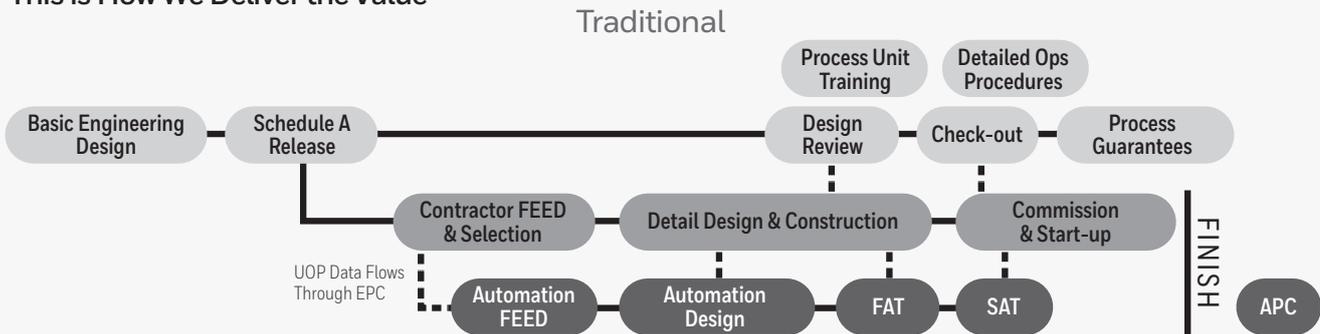


Figure 2.

These Solutions Are Pre-Engineered and Capture Honeywell UOP's Design and Operations Know-how in Honeywell's Automation Platforms

For a Honeywell UOP licensed unit, we provide a comprehensive set of process and automation solutions.

- **UOP Basic Engineering Package (Schedule A)**

This is the basic engineering design that UOP provides for the licensed unit.

- **HPS Distributed Control System (DCS)**

We capture UOP's know-how in the pre-packaged Experion® Solution Suite templates and deliver them in Honeywell's state-of-the-art distributed control system using Honeywell's lean project execution methodology, LEAP. This includes universal channel technology, cloud engineering and virtualization and automated device detection and commissioning.

- **HPS Emergency Shutdown (ESD)**

We capture the cause and effect information from the UOP Schedule A in Honeywell's Safety platform. The fire and gas system for the process units can also be delivered on the same platform.

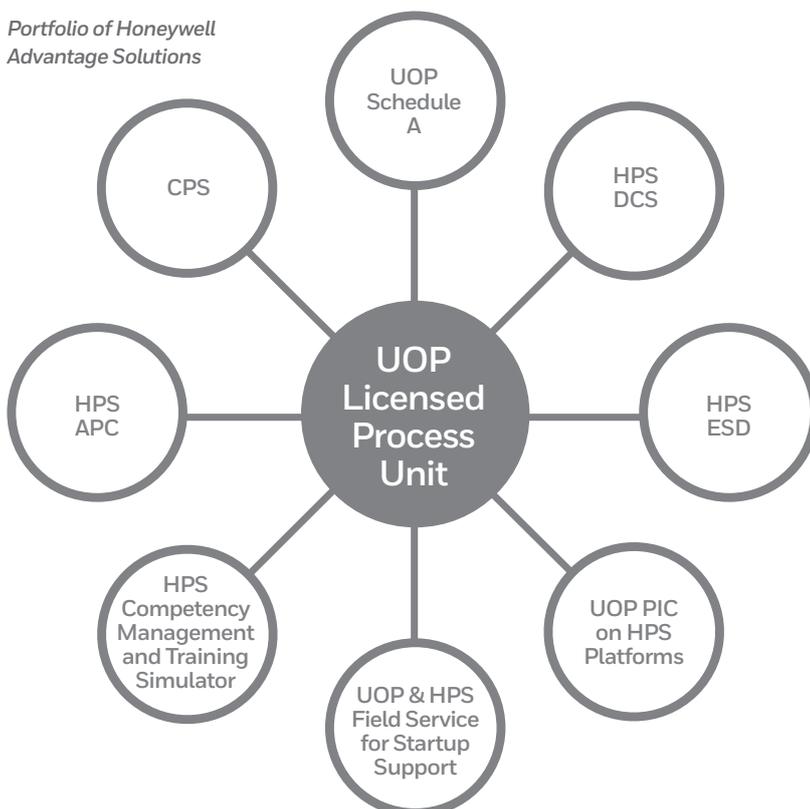
- **UOP Critical Control (PIC and PSA) Applications**

UOP provides some critical control applications that are critical for the operations and performance of their licensed units. Since the Honeywell DCS and ESD platforms work seamlessly together, having the UOP Critical Control Applications on the HPS platforms improve the visibility of these applications from the DCS and reduce maintenance and training costs because of the shared platform.

- **Competency Management Program**

HPS and UOP provide a holistic solution to the challenges faced by our customers in starting up and operating a Greenfield or large Brownfield expansion. The solution, called a Training Management Contractor (TMC), includes curriculum development, candidate screening and assessment, training program development and implementation and certification of all technical staff in the refinery. This program also includes the training courses from both Honeywell UOP and HPS, as well as the UOP Training Simulators in the Cloud for key process units.

Portfolio of Honeywell Advantage Solutions



A Suite of Solutions that Drive Better Performance

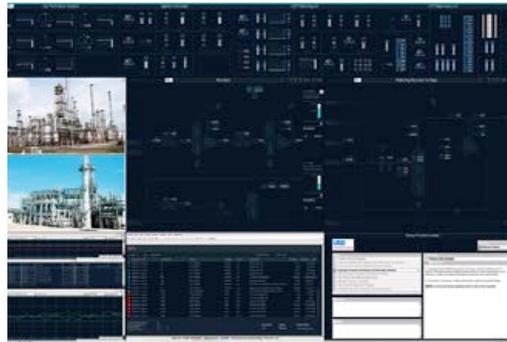
- **UOP and HPS Startup Support**

UOP and HPS provide start-up support for both the process and automation systems. Since the project execution is started using the pre-engineered templates that have already been tested and proven, and the start-up crews are intimately familiar with each other's solutions, they are able to start-up the plant sooner with much fewer punch-list items.

- **HPS Advanced Process Control (APC)**

HPS is the leader in Advanced Process Control for the Hydrocarbon Processing Industry. We are capturing UOP know-how in the HPS APC application in two ways. We have created pre-defined APC packages for key UOP units which capture the UOP's operations know how and HPS's extensive experience in implementing APC in Refining, Petrochemicals and Gas Processing Industries.

In addition, HPS is capturing UOP's design correlations in toolkits that work in conjunction with the APC application. The toolkits calculate variables that are difficult to measure directly using other measurements, thus allowing the APC application to push the process unit closer to its limits without causing any problems.



ASM Consortium Compliant HMI display designed by UOP and HPS experts to reduce operator fatigue and detect and mitigate abnormal events. This pre-engineered template is a part of the Honeywell Advantage Solutions. Project execution starts by using these templates and modifying them for the specific project.



Value Proposition for the Honeywell Advantage Solutions

Honeywell Advantage Solutions reduce project risk, enable early start-up, improve the reliability and availability of the plant and improve its efficiency.

Solution	How it Helps	Value
Pre-built Standard Control Points and Operator Graphics	Reduce risk and take automation out of critical path for start-up	Reduce Project Risk/Improve Operational Readiness
Pre-built Safety System for the Process	Avoid spurious trips; Shutdown the process in a controlled manner, avoiding damage to equipment or catalyst, consistently and reliably	Improve Reliability/Availability
UOP Critical Control Applications on Honeywell Platforms	Eliminating black boxes. Seamless integration with DCS and Emergency Shutdown System. Better visibility. Common components. Lower training and maintenance costs.	Reduce Project Risk/Improve Operational Readiness
UOP Training Simulators in the Cloud	Train engineers and operators early in a safe environment	Improve Reliability/Availability
Pre-built Supervisory Control System for the Process	Start-up, operate and shutdown the process consistently and reliably	Improve Reliability/Availability
Advanced Process Control for the Process	Improve process efficiency (increase throughput, lower energy usage)	Improve Efficiency/Optimization

For more information

To learn more about Honeywell's Applied Process Excellence (APEX) Center, visit www.uop.com or contact your Honeywell account manager.

Honeywell UOP

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